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United States Department of Agriculture — Forest Service — RO

PSW Region

Reply To: 3420

Date: MAR 14 1989

Subject: Biological Evaluation of Willow Creek Timber Sale, LaPorte Ranger District (Report No. 89-7)

To: Forest Supervisor, Plumas NF

James Allison, Plant Pathologist, Forest Pest Management, evaluated Stand 9 in the planned Willow Creek timber sale (T22N, R8E, section 17). He was accompanied by Stuart Lovejoy, Sale Prep Forester, LaPorte Ranger District. Stuart is planning on using this stand for preparing a silvicultural prescription for certification.

This stand, which encompasses 33 acres, is an even-aged (approximately 80 years old), white fir stand growing on a Dunning site 1. Species composition is 99% white fir, and 1% sugar pine, ponderosa pine, and incense-cedar. Basal areas range from 320-460 sq ft/acre with dbh ranging from 18 to 40 inches.

Man-caused disturbances associated with mining in the late 1800's may have contributed to the establishment of this stand. The first commercial timber harvesting occurred in a large green sale entry in the early 1970's. A small salvage sale removed several trees in the same vicinity in the early 1980's.

Mortality, which involves only white fir, has been occurring as scattered individual trees or group of trees in pockets up to an acre in size. It was suspected that a root disease such as annosus root disease might be involved in the creation of the pockets of mortality. Annosus root disease was confirmed by presence of conks of Heterobasidion annosum in windthrows and old white fir stumps.

In my assessment of this situation, the white fir mortality was caused by a combination of stand and weather conditions and annosus root disease. The white fir has been stressed over the past few years from overstocking and drought conditions. Most true fir stand in California are infested with annosus root disease. Vigorously growing young firs are usually able to regenerate root tissues faster than they are lost to root disease, but when the fir slow in growth because of stress conditions and decline in vigor, root development decreases to where there is a net loss in roots to the tree. The tree then enters a period of slow decline due to the gradual loss of its root system. The tree are either windthrown or attacked and eventually killed by fir engravers.

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EXPERIMENT STATION

Willow Creek Timber Sale Alternatives

A. No Action - If no action is taken, mortality in white fir will continue and the pockets of dead trees will enlarge and coalesce. Annosus root disease centers will regenerate principally with white fir. The regenerate white fir will be killed by the fungus before approaching marketable size. The fir portion of the stand (99%) will fall apart, leaving scattering mixed conifers with pockets of true fir in the understory.

B. Salvage and Replant - Under this alternative the District could salvage the dead and dying firs and replant the openings to ponderosa pine. Mortality would continue on the margins of some of the root disease pockets and new root disease pockets would continue to appear in overstocked portions of the stand. The pine regeneration would not be affected by the annosus root disease now in the fir.

C. Salvage, Thin and Replant - In this alternative the dead, dying and weakened trees in and around the root disease centers would be removed, the remaining white fir stand thinned to increase growth and vigor, and the openings created replanted to pine. Some mortality would continue to appear on the margins of the root disease centers as trees which were heavily root-diseased but not identified or designated by the markers continue to die. Some mortality would probably occur in the thinned areas for the same reasons, but this should decline as the stand growth and vigor improves. The pine regeneration should be unaffected by annosus root disease present in the firs.

D. Clearcut and Plant - In this alternative the fir stand would be clearcut and replanted to pine. The pine regeneration should not be affected by annosus root disease present in the true fir.

E. Treat Stumps with Borax - The application of borax to freshly cut white fir stumps does reduce stump infection. However, the efficacy of borax treatment in reducing losses of true fir is uncertain because, even though fresh stumps are a principal means of entry by the fungus into a stand, other means such as wounds on the lower bole and roots of white fir leave trees, may also be significant. Also, the extent of H. annosum infection in the white fir stand cannot be readily determined because infection in true fir usually results in a heart rot, with no above ground crown symptoms produced. Thus, the amount of H. annosum may already be at a level that reducing additional infections would not justify the expense of treatment. Many of the trees that will be harvested may already be infected, thus making borax treatment ineffective. The use of borax will reduce the number of new infections, but the benefit of this reduction is unknown. If pines are planted, the H. annosum infecting fir stumps would not spread to pines. The fir strain of H. annosum does not spread by root contact from true fir to pine.

If there are any question about this evaluation, please contact James Allison at (415) 556-9085.

John Kleyn

For JOHN NEISESS
FPM Program Leader
State and Private Forestry

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